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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/151,555	09/11/1998	RAJEEB HAZRA	42390.P5277	7941

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EXAMINER

ROGERS, SCOTT A

ART UNIT	PAPER NUMBER
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2626

DATE MAILED: 01/20/2004

96

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/151,555

Applicant(s)

HAZRA ET AL.

Examiner

Scott A Rogers

Art Unit

2626

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 22 October 2003.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1,3-5 and 7-29 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1,3-5 and 7-29 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. §§ 119 and 120

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 13) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application) since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.
- a) ☐ The translation of the foreign language provisional application has been received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121 since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

DETAILED ACTION

Response to Amendment

Applicant's amendment filed 22 October 2003 is acknowledged. Upon follow up consideration and updated search, the prior indication of allowability is withdrawn in view of the new ground(s) of rejection.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1, 3, 4, 5, 11-17, and 19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Jung (US 5701368) in view of Paik (US 6370279).

Referring to claims 1, 4, 11, & 16:

Jung discloses generation of an edge detection map (contour data) from an uncoded video frame to be coded, and separately coding said uncoded video frame (110) and said edge detection map (12), for transmission via a communication channel (see col. 2, line 60 to col. 3, line 7 and col. 5, lines 2-3).

Jung does not teach generating the edge detection map (contour data) along a predetermined direction. However, Jung does recognize the importance of detecting the pattern of the edge including different predetermined edge orientations in the

process of generating the scanned data, which is interleaved and then coded to become the coded video frame (col. 3, lines 36-67). The edge detectors 30, 50, 70, and 90 involved in this process are noted as performing edge detection in a similar manner to that done by the contour detector 10 to generate the edge detection map (contour data).

Paik discloses a method of removing blocking artifacts caused by block based image data coding as done in Jung. Paik teaches the generation of an edge detection map along a predetermined direction (see abstract col. 5, lines 48-63).

It would have been obvious to one of ordinary skill in the art to have envisioned a conventional block based image decoder for receiving a transmission from Jung and, in view of Paik, to have included in the decoder Paik's technique for removing blocking artifacts caused by the block based image coding done by Jung. Since Paik uses an edge detection map along a predetermined direction for each block to select the best filtered image block output and since Jung already generates and transmits an edge detection map, it would have been obvious for Jung to have determined and transmitted the edge detection map along a predetermined direction for each block before the block based transformation and coding process takes place in Jung. Such a modification would inherently improve the accuracy of the edge detection map transmitted to the decoder and used for selecting the optimal filtering output at the decoder as taught by Paik.

Referring to claims 3 & 12:

The predetermined edge directions referred to above both in Jung (col. 3, line 57) and Paik (col. 5, lines 31-39) comprise one of the vertical and horizontal directions.

Referring to claims 5, 15, & 17:

As indicated in the above combination including a decoder, Paik teaches the edge-sensitive post-filter to enhance a decoded video frame (removing blocking artifacts), where the post-filtering in the combination would be based on the decoded edge detection map associated with the decoded frame.

Referring to claims 13-14:

Paik clearly discloses the producing more than one edge detection map along more than one direction (col. 5, lines 15-52). The coded edge detection maps and video frame are decoded by the decoder as proposed in the above combination of Jung and Paik.

Referring to claim 19:

It is implied in Jung that the coded video image and edge detection map (contour data) is transmitted via a bandwidth limited communication channel prior to decoding as this is the very reason data is compressed since conventional communication channels are bandwidth limited.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States

Referring to claims 7-8:

Jung discloses generation of an edge detection map (contour data) from an uncoded video frame to be coded, separately coding said uncoded video frame (110) and said edge detection map (12), for transmission via a communication channel (see col. 2, line 60 to col. 3, line 7 and col. 5, lines 2-3). While Jung does not elaborate on whether the coded edge detection map and associated coded video frame are transmitted together via the communication channel or are stored in any way, it can be inferred that the coded edge detection map is transmitted via a communication channel along with the associated coded video frame, since both are sent to a transmitter (not shown) for transmission through a conventional transmission channel as indicated in the cited passages. There would be no reason to transmit the coded edge detection map in Jung unless the map is to be used by a decoder and therefore the coded edge detection map would have to be transmitted along with the associated coded video frame.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 9-10 are rejected under 35 U.S.C. 103(a) as being unpatentable over Jung as applied to claim 7 above, and further in view of well known prior art (MPEP 2144.03).

Referring to claims 9-10:

While Jung does not teach storage in any manner of the coded edge detection map or the associated coded video frame, it is well recognized in the prior art to store coded image data prior to transmission to allow for delayed transmission or to prevent loss in the case of slow or interrupted reception. For that reason, it would have been obvious to one of ordinary skill in the art to have modified Jung in view of the well known prior art to have stored in any manner the coded edge detection map or the associated coded video frame.

Claims 18 and 20-29 are rejected under 35 U.S.C. 103(a) as being unpatentable over the combination of Jung and Paik, as applied to claim 11 and 16-17 above, and further in view of well known prior art (MPEP 2144.03).

Referring to claim 18:

While the combination of Jung and Paik does not teach storage in any manner of the coded edge detection map or the associated coded video frame, it is well recognized in the prior art to store coded image data prior to transmission to allow for delayed transmission or to prevent loss in the case of slow or interrupted reception. For that reason, it would have been obvious to one of ordinary skill in the art to have modified the combination of Jung and Paik in view of the well known prior art to have stored in any manner the coded edge detection map or the associated coded video frame.

Referring to claim 20-29:

The combination of Jung and Paik teach all the features cited in claims 20-29 as discussed above, but do not teach implementation via instructions stored on a medium and executed by a system. However, use of instructions stored on a medium and executed by a system to perform a wide range of image processing applications such as video frame coding and block artifact removal are notoriously well known in the prior art.

It would have been obvious to one of ordinary skill in the art to have modified the combination of Jung and Paik in view of such well known prior art in order to allow wide application of the video frame coding and block artifact removal techniques taught by the combination of Jung and Paik on a common computer equipment and further benefit from the common advantage offered by the use of a computer program.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Scott A Rogers by telephone at 703-305-4726 and by e-mail address at scott.rogers@uspto.gov.

The official fax number for Technology Center 2600 where this application or proceeding is assigned is 703-872-9306.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to TC 2600 Customer Service at 703-306-0377.


SCOTT ROGERS
PRIMARY EXAMINER

12 January 2004